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|---|-------------|----------------------|------------------------|------------------|
| APPLICATION NO.                           | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.    | CONFIRMATION NO. |
| 10/566,207                                | 01/27/2006  | An-Pang Tsai         | 053484                 | 1015             |
| 38834                                     | 7590        | 03/11/2009           | EXAMINER               |                  |
| WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP |             |                      | VAN OUDENAREN, SARAH A |                  |
| 1250 CONNECTICUT AVENUE, NW               |             |                      | ART UNIT               | PAPER NUMBER     |
| SUITE 700                                 |             |                      | 1793                   |                  |
| WASHINGTON, DC 20036                      |             |                      |                        |                  |
| MAIL DATE                                 |             | DELIVERY MODE        |                        |                  |
| 03/11/2009                                |             | PAPER                |                        |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |  |                                    |
|------------------------------|--|------------------------------------|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/566,207   | <b>Applicant(s)</b><br>TSAI ET AL. |
|                              | <b>Examiner</b><br>SARAH VAN OUDENAREN | <b>Art Unit</b><br>1793            |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 11 December 2008.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-5 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5 and 7-11 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 27 January 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al (Quasicrystal Application on Catalyst). Yoshimura teaches a catalyst composition for the steam reforming of methanol. It is taught that an alloy of stable quasicrystal Al<sub>63</sub>Cu<sub>25</sub>TM<sub>12</sub>, where TM is a transition metal, is crushed and leached with an aqueous alkaline solution (page 452, paragraph 3, lines 1-20). The alloy has an aluminum oxide passive layer (page 451, paragraph 3, lines 16-18). The alloy particles also have copper and copper oxide particles dispersed throughout the surface (page 452, paragraph 3, lines 15-18). Yoshimura does not teach a TM oxide being in the surface layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to assume that a TM oxide would remain in the surface layer as the original alloy comprises a TM, and the Cu and Al are oxidizing so it would be obvious that the TM would oxidize as well.

It is noted that, “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different

process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

With the significant amount of product by process in the claim limitations of instant claim 1, it is noted by examiner that the product of claim one is a catalyst comprising Al alloy particles having an oxide surface layer containing fine copper oxide particles where the surface layer is composed of aluminum oxide, copper oxide, and a TM oxide.

Regarding claim 2, Yoshimura teaches that the surface layer comprises CuO ((page 452, paragraph 3, lines 15-18).

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the

prior art product (*In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

Regarding claim 3, Yoshimura teaches that the aluminum oxide layer is formed at the surface of the alloy (page 451, paragraph 2, lines 15-17). Yoshimura also teaches that the surface comprises Cu and copper oxide particles (page 452, paragraph 3, lines 15-18). Although Yoshimura does not explicitly teach the formation of the copper oxide and the TM oxide at the interface of the Al alloy particles, it would have been obvious to one of ordinary skill in the art at the time of the invention to assume that the formation would take place at the surface just as the aluminum oxide formation does. It also would have been obvious to one of ordinary skill in the art at the time of the invention to assume that TM oxide would remain in the surface layer as the original alloy comprises a TM and the Cu and Al are oxidizing so it would be obvious that the TM would oxidize as well.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (*In re Thorpe*, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the

prior art product (*In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

Regarding claim 4, Yoshimura teaches that TM can be Fe, Ru, and Os (page 452, paragraph 2, lines 1-3).

Regarding claim 5, Yoshimura teaches the use of an alloy having Pd and Mn (page 451, paragraph 3, lines 10-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize these elements with the Al-Cu alloy of Yoshimura's invention as Pd is taught by Yoshimura to be an element known in the art to be highly active toward methanol decomposition, but not cost effective (page 451, paragraph 2).

Claims 7, 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al (Quasicrystal Application on Catalyst). Yoshimura teaches a catalyst used for steam reforming of methanol. The method of making is taught to comprise the steps of crushing an Al alloy having a crystalline phase (page 451, paragraph 2) where the formula of the alloy is  $\text{Al}_{63}\text{Cu}_{25}\text{TM}_{12}$ , where TM is a transition metal (page 452, paragraph 2, line 1). The crushed alloy particles were then leached with an aqueous alkaline solution which formed an aluminum oxide layer on the surface of the materials (page 452, paragraph 2). The surface taught is considered to have Cu and CuO particles throughout the surface (page 452, paragraph 3, lines 15-18). Yoshimura does not teach a TM oxide being in the surface layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to assume that TM oxide would

remain in the surface layer as the original alloy comprises a TM and the Cu and Al are oxidizing so it would be obvious that the TM would oxidize as well. Yoshimura does not teach a heat treatment to oxidize the Cu to CuO, however there is CuO present. One of ordinary skill at the time of the invention would find it obvious to use a heat treatment in an oxidizing atmosphere to produce CuO from Cu particles.

Regarding claim 8, Yoshimura teaches that the surface layer comprises CuO ((page 452, paragraph 3, lines 15-18).

Regarding claim 11, Yoshimura teaches that approximately 15% of Al in the alloy is leaches out (page 452, paragraph 3, lines 10-11).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al (Quasicrystal Application on Catalyst) as applied to claim 7 above, and further in view of Kazuhito et al (JP 03-238049). Yoshimura teaches a method or preparing catalyst composition for the steam reforming of methanol, as discussed above. Yoshimura does not explicitly teach the temperature range of the aqueous alkaline solution within the range of the instant claim. Kazuhito teaches a methanol reforming catalyst consisting of Cu, Zn, and Al in an alkali solution of 30-60°C in order to prepare the catalyst (see abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the temperature range of Kazuhito with the catalyst preparation of Yoshimura in order to arrive at the product of Yoshimura as it is shown to be an effective temperature for preparation of the catalyst.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al (Quasicrystal Application on Catalyst) as applied to claim 7 above, and further in view of Moriga et al (JP 402233501A). Yoshimura teaches a method or preparing catalyst composition for the steam reforming of methanol, as discussed above. Yoshimura teaches the aqueous alkaline solution being NaOH (page 452, paragraph 3, lines 3-5), however, Yoshimura does not teach the percentage of NaOH to meet that of the instant claim. Moriga teaches an alloy which is converted to a catalyst for reforming methanol comprising Al, Cu, Zn or Cr. Moriga teaches leaching the alloy in an aqueous alkaline solution of 1-40% NaOH in order to dissolve the Al from the surface of the alloy (see abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the percentage of NaOH of Moriga with the catalyst preparation of Yoshimura in order to dissolve the Al from the surface of the alloy during leaching.

#### ***Response to Arguments***

Applicant's amendments have overcome the objections to claims 1,2,7, and 8.

Applicant's arguments filed 12/11/2008 have been fully considered but they are not persuasive.

Applicant's arguments regarding the 103 rejection over Yoshimura towards claims 1-5 is not persuasive because although the experimental portion discusses reducing the samples prior to reaction, examiner does not agree that this will render the final prepared catalyst surface as reduced to Cu metal as Yoshimura clearly states that the prepared catalyst powder can be viewed as having Cu and copper oxide particles

Art Unit: 1793

sitting on the surface (pg 452, paragraph 3, lines 17-20) as discussed above. Further, as the preamble of the claim recites a catalyst for steam reforming of methanol, this is considered intended use. Yet still further, Yoshimura teaches, as stated above, a catalyst for use in steam reforming of methanol therefore the function of the catalyst is considered comparably the same.

Applicant's arguments regarding the 103 rejection over Yoshimura towards claims 7, 8, and 11 are not persuasive as Yoshimura teaches the final prepared catalyst powder to have copper oxide particles sitting on the surface as discussed above. Yoshimura does not teach a heat treatment to oxidize the Cu to CuO, however there is CuO present. One of ordinary skill at the time of the invention would find it obvious to use a heat treatment in an oxidizing atmosphere to produce CuO from Cu particles.

Applicant's arguments regarding the 103 rejection over Yoshimura as modified by Kazuhito towards claim 9 as well as the 103 rejection over Yoshimura as modified by Moriga towards claim 10, are not persuasive as applicant only argues these rejections not being proper insofar as Yoshimura does not teach a heat treatment to oxidize the copper particles. However, Yoshimura teaches the surface to be covered in Cu and copper oxide particles. One of ordinary skill at the time of the invention would find it obvious to use a heat treatment in an oxidizing atmosphere to produce CuO from Cu particles.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH VAN OUDENAREN whose telephone number is (571)270-5838. The examiner can normally be reached on Monday-Thursday, 9:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SVO  
March 2, 2009

/Melvin Curtis Mayes/  
Supervisory Patent Examiner, Art Unit 1793